

EXHIBIT M

More Researchers Discover Corn Transformation Technology

by Bill Freiberg

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Nearly overnight, corn genetic transformation technology has become almost commonplace.

All in the same week, the USDA, Monsanto, and DeKalb Genetics announced they have solved the puzzle of corn transformation technology.

What this new technology essentially does, is allow scientists to insert genes into corn breeding stock, and have that genetic trait passed on into the hybrid offspring. These genes can come from any source...animals, bacteria, or other plants...and opens the doors for routine genetic engineering of corn.

This is revolutionary technology in the hybrid corn business, for when fully developed, it will give plant breeders huge new sources of genes to insert into corn, for such traits as disease resistance, drought resistance, yield increases, protein enhancement, and so on...plus cut many years off the time needed to develop their exotic new hybrids.

The USDA-Monsanto announcement was the result of a joint venture between the two, and the DeKalb discovery was made independently. But apparently they're both using the same technology, which involves blasting the new genes into the corn with Du Pont's biolistic gene gun.

As recently as a couple of months ago, BioTechnica Agriculture announced that it had made the world's first discovery of genetic corn transformation, and said they expected this breakthrough to eventually propel them into the ranks of a major hybrid corn company in the years ahead. BioTechnica indicated they would file for patents on their new technology.

But these new announcements indicate that this technology may now be available on a much more widespread basis than previously thought, as USDA and Monsanto representatives say they don't think their particular discoveries are patentable.

Dr. Michael Fromm, a molecular biologist, and senior scientist at the USDA's Agricultural Research Service unit at Albany, CA, made the USDA-Monsanto joint announcement. Dr. Fromm is a pioneer scientist in working with genetic transformation of corn, and a worldwide leader in this field.

In an interview, Dr. Fromm told AgBiotechnology News that the new technology has turned out to be relatively simple to use, now that the basic research has been accomplished, and potentially is within the reach of many seed corn companies.

"I didn't think it looked easy the first time," Dr. Fromm said. "But having seen it now, I'd say it's clearly a reproducible, routine, technique."

He used the Du Pont particle gun to get the genes into corn, which he described as the "easiest" part.

"I could take a high school student, and in five minutes show him how to bombard genes into plant cells," he said.

"The tricky part is what happens afterwards. What happens next, takes considerable effort...all the culturing, selections, and regeneration."

Dr. Fromm said he does not believe the technique is patentable, due to its relative simplicity, and the fact that a considerable amount of prior research

information has already been published on the technique.

"We've been publishing for years," he said.

"We've already made this technology available in the public domain," he said, "so we don't think there's anything anyone can own here."

He did point out that the Du Pont gene gun is patented, but he also said that these recent discoveries could eventually lead to other methods of inserting genes into corn, including electroporation.

A Monsanto spokesman agreed on the patenting issue, telling AgBiotechnology News that they would not pursue patents on this particular technology, and that the likely avenue for patents in corn transformation would be in specific enhancements and improvements to the technology.

A spokesman for DeKalb said the company would not comment on whether or not it would pursue patents for its technology.

Dr. Fromm said his own research would continue to improve his newly-discovered technology, with two major goals: to increase the efficiency of the process, to make it easier to transform larger numbers of plants; and also to conduct more experiments with transgenic plants to determine which vectors work well, and how to get high levels of gene expression in the right kinds of tissues.

When asked if he thought this would lead to routine genetic engineering of corn, Dr. Fromm replied:

"Absolutely...there's no question about it." ■

The Amazing Du Pont Biolistic Gun To Be Demonstrated at AgTech '90 Conference

The so-called "particle gun," that has made genetic engineering of corn possible, is a patented device that's available from Du Pont.

A Du Pont spokesman said, contrary to popular belief, the gun is easy to use, and well within the capabilities of even a small laboratory. "It can be learned in a few minutes," he said.

He said the gun is available to anyone, under a lease agreement with Du Pont.

Du Pont will be giving a first-hand demonstration of the particle gun at the upcoming AgTechnology '90 Conference in St. Louis Sept 17-20. For more information on the conference, and how to reserve a seat in this session, write to AgTechnology '90, P.O. Box 7, Cedar Falls IA 50613.

For details on the particle gun, Du Pont provides a toll-free number: 1-800-551-2121.